

CLAIMS

1. A stripline device, comprising:
a metal having a valve action, which has an increased surface area;
a dielectric coating formed on a surface of the metal having the valve action; and
a conductive material layer formed around the metal having the valve action via the dielectric coating.
2. The stripline device according to claim 1, further comprising a metal member which is disposed in contact with the conductive material layer and transmits direct-current power to be inputted, wherein input/output terminals are provided on both ends of the metal having the valve action and both ends of the metal member, and a high-frequency electromagnetic wave is inputted to a transmission line composed of the dielectric coating.
3. The stripline device according to claim 1 or 2, wherein the metal having the valve action is rectangular in cross section.
4. The stripline device according to claim 1 or 2, wherein the metal having the valve action is circular or oval in cross section.
5. The stripline device according to claim 1 or 2, wherein the metal having the valve action is shaped like a ring in cross section.
6. The stripline device according to claim 1 or 2, wherein the metal having the valve action is formed into a plate or foil.
7. The stripline device according to any one of claims 1 to 6,

wherein the metal having the valve action is bent or curved in the same direction from a major surface in the vicinity of both ends of the metal.

8. The stripline device according to any one of claims 1 to 7, wherein the metal having the valve action has a longitudinal dimension larger than a cross sectional dimension.

9. The stripline device according to any one of claims 1 to 8, wherein the metal having the valve action is provided with a pair of first electrode leading terminals on both ends in a longitudinal direction of the metal to make connection to through holes of a printed wiring board, and a pair of second electrode leading terminals on different positions of the metal member to make connection to through holes of the printed wiring board.

10. The stripline device according to claim 9, wherein the electrode leading terminal in contact with the printed wiring board has an area larger than a cross-sectional area of the electrode leading terminal not coming into contact with the printed wiring board.

11. The stripline device according to claim 2, further comprising first electrode leading terminals which are connected to ends of the metal having the valve action in the stripline device disposed on the metal member and make electrical connection to the printed wiring board, wherein:

second electrode leading terminals for making connection to the printed wiring board are integrally formed on the metal member; and

the second electrode leading terminals integrally formed on the metal member and the first electrode leading terminals connected to both ends of the metal having the valve action form four terminals of the

stripline device.

12. The stripline device according to claim 11, wherein:

the first electrode leading terminal includes:

a connecting member for making connection to the metal having the valve action in the stripline device disposed on the metal member;

a first leg member for making connection to a wire on the printed wiring board; and

a first body member for connecting the connecting member and the leg member;

the connecting member and the first leg member connected to the first body member are both ends in a longitudinal direction of the first body member and connected almost perpendicularly to the first body member;

the second electrode leading terminal integrally formed on the metal member includes:

a second body member directly connected to the metal member; and

a second leg member for making connection to a wire on the printed wiring board;

the second body members are both ends in a longitudinal direction of a mounting surface of the metal member for mounting the stripline device and connected to an end on the same long side of the mounting surface; and

the second leg member is connected to the body member almost in parallel with the mounting surface.

13. The stripline device according to claim 11, wherein:

the first electrode leading terminal includes:

a connecting member for making connection to the metal having

the valve action in the stripline device disposed on the metal member;

a first leg member for making connection to a wire on the printed wiring board; and

a first body member for connecting the connecting member and the leg member;

the connecting member and the first leg member connected to the first body member are both ends in a longitudinal direction of the first body member and connected almost perpendicularly to the first body member such that the connecting member and the first leg member are placed on opposite sides of the first body member; and

the second electrode leading terminals integrally formed on the metal member includes:

second leg members which are both ends in a longitudinal direction of a mounting surface of the metal member for mounting the stripline device and connected to an end on the same long side of the mounting surface almost in parallel with the mounting surface.

14. The stripline device according to claim 11, wherein:

the first electrode leading terminal includes:

a connecting member for making connection to the metal having the valve action in the stripline device disposed on the metal plate; and

a first body member for making connection to a wire on the printed wiring board;

the connecting member is connected to an end in a longitudinal direction of the first body member almost perpendicularly to the first body member; and

the second electrode leading terminals integrally formed on the metal member includes:

second body members which are both ends in a longitudinal direction of a mounting surface of the metal member for mounting the

stripline device and connected to an end on the same long side of the mounting surface almost perpendicularly to the mounting surface.

15. The stripline device according to claim 11, wherein:
the first electrode leading terminal includes:

a connecting member for making connection to the metal having the valve action in the stripline device disposed on the metal plate; and

a first body member for making connection to a wire on the printed wiring board;

the connecting member is connected to an end in a longitudinal direction of the body member almost perpendicularly to the first body member;

the second electrode leading terminal integrally formed on the metal member includes:

a second body member which is an end in a longitudinal direction of a mounting surface of the metal member for mounting the stripline device and connected to an almost central area of a short side of the mounting surface almost perpendicularly to the mounting surface; and

the first electrode leading terminal and the second electrode leading terminal are disposed almost in line with each other in the longitudinal direction of the mounting surface of the metal member.

16. The stripline device according to any one of claims 11 to 13, wherein the first leg member and the second leg member in contact with the printed wiring board have an area larger than a cross sectional area of the first body member and the second body member not coming into contact with the printed wiring board.

17. The stripline device according to any one of claims 1 to 16, wherein the conductive material layer includes a layer of a conducting

polymer.

18. The stripline device according to claim 17, wherein the conducting polymer is one or more compounds selected from the group consisting of polypyrrole, polythiophene, and polyaniline, or a derivative of the compounds.

19. The stripline device according to claim 17 or 18, wherein the conductive material layer has the conducting polymer layer disposed on a side of the dielectric coating and a conductive paste layer formed on the conducting polymer layer.

20. The stripline device according to claim 19, wherein the metal member is fixed on the conductive paste layer.

21. The stripline device according to any one of claims 1 to 20, wherein the metal having the valve action is a metal selected from the group consisting of aluminum, tantalum, and niobium.

22. The stripline device according to any one of claims 1 to 21, wherein the metal having the valve action, the dielectric coating, and the conductive material layer are molded with resin.

23. A printed wiring board mounting member having a laminated structure in which a dielectric coating is interposed between conductors, comprising:

a low impedance line device having a dielectric loss in the dielectric coating;

first electrode leading terminals which are disposed on both ends of one of the conductors and make electrical connection to a printed wiring

board; and

second electrode leading terminals which are disposed on both ends of a metal member for mounting the low impedance line device and make electrical connection to the printed wiring board; wherein:

the first electrode leading terminal includes:

a connecting member for making connection to the first conductor;

a first leg member for making connection to a wire on the printed wiring board; and

a first body member for connecting the connecting member and the leg member;

the connecting member and the first leg member connected to the first body member are both ends in a longitudinal direction of the first body member and connected almost perpendicularly to the first body member;

the second electrode leading terminal includes:

a second body member directly connected to the metal member; and

a second leg member for making connection to a wire on the printed wiring board;

the second body members are both ends in a longitudinal direction of a mounting surface of the metal member for mounting the low impedance line device and connected to an end on the same long side of the mounting surface; and

the second leg member is connected to the body member almost in parallel with the mounting surface.

24. A printed wiring board mounting member having a laminated structure in which a dielectric coating is interposed between conductors, comprising:

a low impedance line device having a dielectric loss in the dielectric

coating;

first electrode leading terminals which are disposed on both ends of one of the conductors and make electrical connection to a printed wiring board; and

second electrode leading terminals which are disposed on both ends of a metal member for mounting the low impedance line device and make electrical connection to the printed wiring board;

the first electrode leading terminal includes:

a connecting member for making connection to the first conductor;

a first leg member for making connection to a wire on the printed wiring board; and

a first body member for connecting the connecting member and the leg member;

the connecting member and the first leg member connected to the first body member are both ends in a longitudinal direction of the first body member and are connected almost perpendicularly to the first body member such that the connecting member and the first leg member are placed on opposite sides of the first body member; and

the second electrode leading terminals include:

second leg members which are both ends in a longitudinal direction of a mounting surface of the metal member for mounting the low impedance line device and connected to an end on the same long side of the mounting surface almost in parallel with the mounting surface.

25. A printed wiring board mounting member having a laminated structure in which a dielectric coating is interposed between conductors, comprising:

a low impedance line device having a dielectric loss in the dielectric coating;

first electrode leading terminals which are disposed on both ends of

one of the conductors and make electrical connection to a printed wiring board; and

second electrode leading terminals which are disposed on both ends of a metal member for mounting the low impedance line device and make electrical connection to the printed wiring board;

the first electrode leading terminal includes:

a connecting member for making connection to the first conductor; and

a first body member for making connection to a wire on the printed wiring board;

the connecting member is connected to an end in a longitudinal direction of the first body member almost perpendicularly to the first body member; and

the second electrode leading terminals includes:

second body members which are both ends in a longitudinal direction of a mounting surface of the metal member for mounting the low impedance line device and connected to an end on the same long side of the mounting surface almost perpendicularly to the mounting surface.

26. A printed wiring board mounting member having a laminated structure in which a dielectric coating is interposed between conductors, comprising:

a low impedance line device having a dielectric loss in the dielectric coating;

first electrode leading terminals which are disposed on both ends of one of the conductors and make electrical connection to a printed wiring board; and

second electrode leading terminals which are disposed on both ends of a metal member for mounting the low impedance line device and make electrical connection to the printed wiring board;

the first electrode leading terminal includes:

a connecting member for making connection to the first conductor;
and

a first body member for making connection to a wire on the printed wiring board;

the connecting member is connected to an end in a longitudinal direction of the first body member almost perpendicularly to the first body member;

the second electrode leading terminal includes:

a second body member which is an end in a longitudinal direction of a mounting surface of the metal member for mounting the low impedance line device and connected to an almost central area of a short side of the mounting surface almost perpendicularly to the mounting surface; and

the first electrode leading terminal and the second electrode leading terminal are disposed almost in line with each other in the longitudinal direction of the mounting surface of the metal member.

27. The printed wiring board mounting member according to claim 23 or 24, wherein the first leg member and the second leg member in contact with the printed wiring board have an area larger than a cross sectional area of the first body member and the second body member not coming into contact with the printed wiring board.

28. The printed wiring board mounting member according to any one of claims 23 to 27, wherein the low impedance line device is molded with resin.

29. A circuit board having a metal having a valve action which has an increased surface area, a dielectric coating formed on a surface of the

metal having the valve action, a conductive material layer formed around the metal having the valve action via the dielectric coating, and a metal member for transmitting direct-current power to be inputted, comprising:

a stripline device having input/output terminals on both ends of the metal having the valve action and both ends of the metal member;

a board;

a first power supply wire and a second power supply wire formed on the board; and

first input/output terminals provided on both ends of the metal having the valve action and second input/output terminals provided on both ends of the metal member which are connected to the first power supply wire and the second power supply wire, respectively.

30. The circuit board according to claim 29, wherein circuit elements for receiving power of an equal voltage are disposed on the circuit board in an integrated manner, and an equal power is supplied by a bus bar.

31. A semiconductor package having a metal having a valve action which has an increased surface area, a dielectric coating formed on a surface of the metal having the valve action, a conductive material layer formed around the metal having the valve action via the dielectric coating, and a metal member for transmitting direct-current power to be inputted, comprising:

a stripline device having input/output terminals on both ends of the metal having the valve action and both ends of the metal member;

a substrate made of an insulating material; and

a semiconductor chip mounted on the substrate; wherein:

the substrate has a first connector pin and a second connector pin which make connection to a device mounted on the board;

the semiconductor chip has a first power supply wire and a second power supply wire; and

the input/output terminals provided on both ends of the metal having the valve action and both ends of the metal member are connected to the connector pins of the substrate and the power supply wires of the semiconductor chip, respectively.

32. A method of forming a stripline device, comprising the steps of:
forming a metal having a valve action, which has an increased surface area;

forming a dielectric coating on a surface of the metal having the valve action;

forming a conductive material layer around the metal having the valve action via the dielectric coating;

positioning and bonding stripline devices and a plurality of substrates, on which a metal member having a second electrode leading terminal and a lead frame serving as a first electrode leading terminal are integrally formed, such that the conductive material layer and the metal member are in contact with each other and the lead frame and the metal having the valve action are in contact with each other, the stripline device being obtained in the steps before the step of forming the conductive material layer; and

cutting the second electrode leading terminal and the lead frame from the substrate at a predetermined distance to complete the stripline device.